

**STATEMENT OF GUY CARUSO
ADMINISTRATOR
ENERGY INFORMATION ADMINISTRATION
U.S. DEPARTMENT OF ENERGY**

before the

COMMITTEE ON ENERGY AND COMMERCE

U. S. HOUSE OF REPRESENTATIVES

May 4, 2006

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to appear before you today to discuss the world oil market situation.

The Energy Information Administration (EIA) is the independent statistical and analytical agency within the Department of Energy. We are charged with providing objective, timely, and relevant data, analysis, and projections for the use of the Congress, the Administration, and the public. We do not take positions on policy issues. We do produce data, analysis, and forecasts that are meant to assist policymakers in their energy policy deliberations. Because we have an element of statutory independence with respect to this work, our views are strictly those of EIA and should not be construed as representing those of the Department of Energy or the Administration.

Oil market developments are a matter of vital interest to all Americans. During most of the 1990s, the West Texas Intermediate (WTI) crude oil price averaged close to \$20 per barrel, but plunged to almost \$10 per barrel in late 1998 as a result of the Asian financial crisis slowing demand growth while extra supply from Iraq was entering the market for the first time since the Gulf War. During that time, the Organization of Petroleum Exporting Countries (OPEC) producers adhered to a coordinated production quota and reduced output. Crude oil prices not only recovered, but increased to about \$30 per barrel as demand grew. The recent increase in crude oil prices began in 2004, when crude oil prices almost doubled from 2003 levels, rising from about \$30 per barrel at the end of 2003 to peak at \$56.37 on October 26, 2004. After falling back briefly, prices then continued to rise in 2005 and in the early months of 2006. Just recently, we have seen WTI prices rise above \$70 per barrel. This is a significant change from what we experienced during the latter half of the 1980s and the 1990s. As requested in your invitation, my testimony focuses on the major forces at work in today's oil market and then briefly reviews EIA's current assessment.

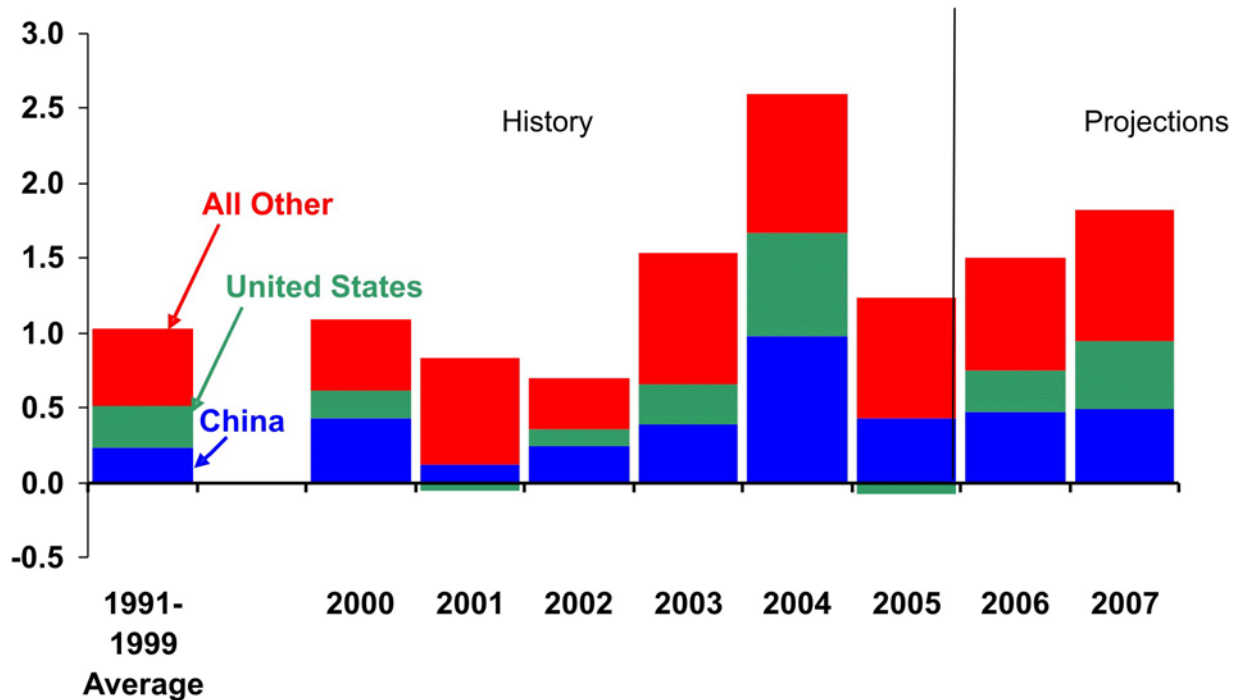
Major Forces Affecting World Oil Markets

Crude oil prices are determined in international markets. All else being equal, higher prices should tend to reduce oil demand and increase supply. However, oil demand is also strongly influenced by economic growth, weather patterns, and the availability and price of other fuels. Moreover, oil supply can be

significantly affected by weather-related disruptions, instability, impediments to investment in key oil producing areas, and, under certain market conditions, decisions by producers to withhold supplies. Because there are considerable lags in the investment and behavioral responses to changing oil prices, recent price increases have had only a very small immediate impact on the amount of oil consumed or produced. For this reason, changes in the key non-price factors that can shift demand and supply at any point in time can result in significant price swings, particularly when oil markets are tight. Given the inherent uncertainty in oil markets, commercial inventories of crude oil and products and surplus oil production and refining capacity serve as cushions to absorb the impacts of unexpected shifts in oil supply or demand. International arbitrage in products, such as the movement of gasoline from Europe to the United States, is yet another form of cushioning. All of these factors are interrelated, as will be discussed in more detail below.

Demand. Recent years have seen a significant acceleration in oil consumption growth, largely driven by strong global economic growth. As illustrated in **Figure 1**, oil consumption, which grew at a rate, on average, of roughly 1 million barrels per day throughout the 1990s, accelerated sharply in 2003 and especially in 2004, when global oil demand grew by 2.5 million barrels per day. Demand growth has been particularly strong in China, other emerging economies in Asia, and the United States. In 2005, although available data to date indicate that U.S. oil consumption was essentially flat at the 2004 level, world consumption grew by well over 1 million barrels per day despite rising prices. In addition to demand for consumption, there is also a demand for commercial (non-strategic) stocks of crude oil and products. Commercial oil stocks have recently been growing, as discussed below.

**Figure 1. World Oil Demand Growth
(million barrels per day)**



Source: EIA, Short-Term Energy Outlook, April 2006

Supply. Growth in production and productive capacity is shaped by geological, economic, and political factors. Production in countries that are not members of OPEC accounts for about 60 percent of total crude oil supply. Crude oil suppliers outside of OPEC generally produce at maximum rates (i.e., no surplus production capacity) for economic reasons.

Although they provide only about 40 percent of the world's oil supply, capacity, and production, statements by the member countries of OPEC are closely watched. Unlike other producers, OPEC and its members explicitly seek to influence world prices by varying production levels relative to available capacity. Middle East countries that are members of OPEC also hold the bulk of the world's proved reserves of oil.

For most of the time since the early 1980s, OPEC members, primarily Saudi Arabia, have maintained a considerable margin of surplus crude oil production capacity. The large growth in non-OPEC capacity and production in areas like the North Sea, Russia, and Alaskan North Slope, along with softening

demand in response to the substantial increase in oil prices following the two oil price shocks of the 1970s, led to major cuts in OPEC production in the 1980s, creating large capacity surpluses. As oil demand grew through the 1990s, OPEC production increased without a corresponding increase in capacity, and the margin of surplus capacity generally narrowed. However, while short-term imbalances between supply and demand resulted in some price swings during the 1990s, those imbalances did not last long, as capacity generally existed to remedy the situation within a year.

Even as demand growth slowed somewhat in 2005 compared to 2004, 2005 witnessed no real growth in non-OPEC supply, in part because of the U.S. hurricanes, but also because of other factors such as project delays and significant natural decline in mature producing areas. Hence, instead of 2005 giving the market time to breathe after the rapid demand growth in 2004, market conditions in 2005 only grew tighter.

Ongoing supply uncertainties associated with Iraq and Nigeria and investment uncertainties in Russia and Venezuela have added to market concerns over the availability of crude oil, and prices have continued to rise. In 2005, Iran and Ecuador added new uncertainties. So far in 2006, we have seen continued, if not growing, geopolitical risks, with Chad most recently added to the list of potential concerns.

Refining (Downstream) Capacity Constraints. In the past few years, even as crude oil prices rose sharply, a great deal of attention has been turned toward the importance of the refining sector, especially following the hurricanes last fall. The storm-related shutdown of many Gulf Coast refineries highlighted a situation that had been developing for some time. Excess capacity in the refining industry, like that for crude oil production, has been shrinking as demand has grown, leaving less of a buffer for emergencies or any periods when the balance between supply and demand becomes unusually tight. The reduction in excess refining capacity is a global phenomenon. EIA estimates that global refinery utilization has grown to about 90 percent of capacity, up from 85 percent as recently as 2002, as the overall growth in demand for petroleum products has outpaced refinery additions.

Historically, price differentials between crude oil and petroleum products have varied significantly over time due to a number of influences, the greatest of which is seasonality. Even in the absence of changes in the underlying cost of the crude oil from which they are refined, gasoline and distillates (including heating oil, diesel fuel, and jet fuel) exhibit seasonal pricing cycles over the course of the year. Gasoline prices (and differentials from crude oil) tend to rise before and during the summer, when demand for it is

greater, and decline in the winter. Distillate prices and differentials, on the other hand, tend to increase over the fall and early winter, as space-heating demand increases, then to drop in the spring.

This underlying seasonal pattern has always been subject to distortion under unusual situations, such as supply interruptions or severe weather, which can affect both supply and demand. But by and large, the seasonal shifts in differentials between crude oil and petroleum product prices were relatively consistent, and thus predictable. In recent years, however, as excess refinery capacity has dwindled, these price spreads have become subject to much wider swings, both seasonally and under unusual supply or demand conditions. For example, through the 1990s, the average spread between U.S. spot gasoline and WTI crude oil prices generally swung from a low of less than 10 cents per gallon during the winter months to a high of around 20 cents in the summer. Since 2000, the corresponding range has been from a winter low of about 10 cents to a summer high of 30 to 40 cents, with last year featuring an all-time monthly average high of 67 cents in September, following Hurricane Katrina.

Much has been made of these higher differentials and the accompanying higher profits to refiners. Clearly, when refinery utilization rates were below today's high level, margins were generally lower but so was refining profitability, providing little incentive for the building of new refining capacity. As a result, as product demand caught up to existing refinery capacity, capacity that was not fully utilized has effectively disappeared in the United States, and consequently refining margins have grown. A number of U.S. refiners have announced major refinery expansion projects to be completed in the next few years.

Commercial Inventories of Crude Oil and Products. When the lack of surplus capacity along the entire supply chain is put in context of an oil market where uncertainties about future supply abound (e.g., Iran, Nigeria, Iraq, and Venezuela), market participants are concerned about being able to get needed supplies should something cause a drop in supply.

As a result, many of them have stored additional inventories as a buffer should there be a supply problem at some point in the future. In other words, whereas markets have traditionally relied on available surplus capacity to provide a part of the response to any unexpected supply problems, under current tight capacity conditions, inventories must play a relatively larger role in buffering the market, and the demand for inventories has increased, putting upward pressure on prices.

Additionally, until the most recent surge in crude oil prices, oil market futures prices were in contango, i.e., a market in which prices for commodities delivered in future months are higher than for those delivered in months closer to the present. This provides economic incentive for suppliers to build inventories as they can buy physical barrels at current prices, but hedge against any drop in prices by selling contracts at higher prices on the futures market. Of course, one of the reasons oil markets were in contango is concern about the potential of a disruption in supplies in the future, either from events overseas or from hurricanes, for example.

Thus, until either surplus capacity increases significantly or many of the perceived uncertainties in the market are removed, oil markets could see high inventories coexist with high prices for the foreseeable future. Oil market analysts used to the old, inverse relationship between inventories and prices need to understand that new market dynamics (lack of surplus capacity and contango) have significantly altered this linkage. This perception that high oil prices may continue for some time encourages non-physical traders to buy up contracts, adding further support to high prices on commodity markets. In addition, the volume of non-physical traders has increased in recent years, meaning that speculative investors have a somewhat greater effect on price than in the past. Nevertheless, such speculation is more an effect of real market conditions than a cause, in and of itself, of high prices.

Crude Oil Price Differentials. As global oil demand growth has outpaced supply, shrinking available surplus crude oil production and refining capacity, another factor has become increasingly important – the quality of the crude oil streams available. The very limited amount of surplus oil production capacity is increasingly concentrated in heavy, sour (high-sulfur) crude, at a time when demand growth for “light” products such as gasoline, diesel fuel, and jet fuel has been particularly strong. The decline in average crude quality has put even more strain on a global refining system that is already running at unprecedented utilization rates to turn available feedstocks into the desired product slate.

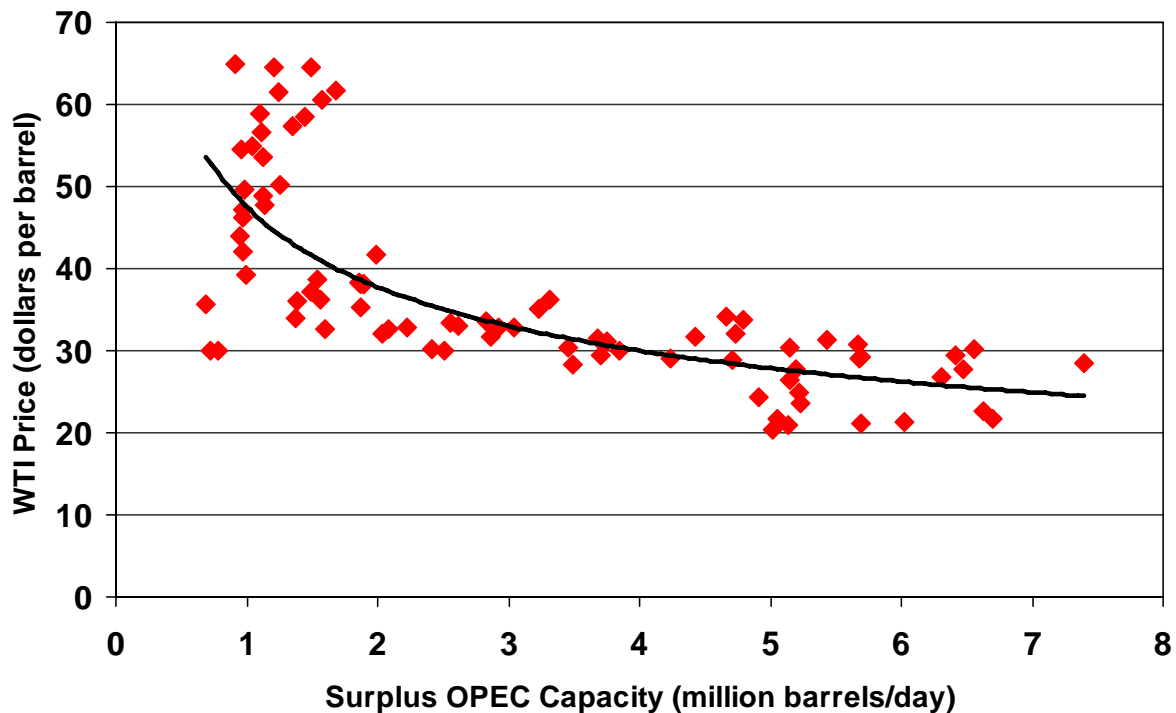
The combination of higher demand for “clean” and “light” products and tighter supply of light, sweet crude oils has resulted in wider price differentials between crude types. Thus, in addition to higher average world crude oil prices, the prices of high-quality crude oils, which can yield the highest percentages of gasoline and other light products, have grown even faster than the average, placing an even

greater price premium on “clean” products such as reformulated gasoline and low-sulfur diesel fuel. The price differential between crude oil types also places a greater premium on high-upgrading refinery capacity, including facilities able to remove more sulfur and produce higher yields of light products from heavier crude streams. Along with tightening product specifications and other environmental constraints, these trends have forced refiners to spend more capital on upgrading existing refinery equipment, at the expense of greater capacity growth.

Is There an Additional “Fear” Premium? Some analysts, noting that oil markets have recently shown price changes that they deem to be “unwarranted” in response to seemingly innocuous news, have argued that prices are high due to speculation or a “fear” or “risk” premium. What is missing from this argument is recognition that under the current tight oil market conditions described above, there is very little flexibility in the global production or refining system to react to potential supply shortfalls or demand surges. EIA currently estimates that global surplus crude oil production capacity is only about 1.0-1.5 million barrels per day. The relationship between surplus OPEC capacity and prices is depicted in **Figure 2**. As many as 20 different countries currently produce at least 1 million barrels per day.

Flexibility in oil markets is currently very limited in the capacity to produce significant incremental volumes of crude oil or light products. Under these conditions, it is not too surprising that traders would bid prices up and down substantially on what may, on the surface, appear to be insignificant news, but what can, nevertheless, change expectations about what the future may hold. This is why oil prices can increase as fears about the damage a hurricane might inflict arise as the hurricane approaches, only to see them fall as the hurricane turns away from the oil facilities in the Gulf of Mexico region, or as concerns about having enough oil on hand when world total product demand peaks in the winter cause prices to go up in the summer. When oil markets are as tight as they are, relatively small changes in the actual or perceived supply and demand picture, which may result from seemingly innocuous news items, can have a magnified impact on oil prices. Simply put, any “fear” or “risk” premium would be hard to sustain without the fundamentals of supply and demand already being tight. EIA believes that supply and demand factors can explain almost all of the price increases seen over the last few years, particularly when it is recognized that demand for high inventories is rational under conditions of tight surplus capacity and supply uncertainty.

Figure 2. WTI Crude Oil Price vs. OPEC Surplus Crude Oil Production Capacity, April 1999 - March 2006



Sources: WTI - Reuters; Surplus Capacity - EIA calculations

The Outlook for Oil Markets

EIA's monthly *Short-Term Energy Outlook* is fairly representative with regards to projections of world oil prices and world oil market trends. However, for the reasons discussed above, it should be noted that energy price projections are particularly uncertain, because small shifts in either supply or demand can necessitate large short-term price movements to restore balance under current tight oil market conditions. EIA has been saying for many months that the world oil market is tight, and that world oil prices are likely to remain high over the next 2 years. Most analysts now agree with this assessment, and last week the International Energy Agency (which does not make short-term price projections) went on record with this viewpoint as well. This is in contrast to the diversity of views expressed just last year, when many

other analysts believed that prices were out of line with market fundamentals and would not remain high for an extended time.

In addition, EIA's assessment of world oil demand growth is similar to those of other analysts. EIA currently projects demand growth of 1.5 million barrels per day in 2006, within the 1.2 to 1.7 million barrels-per-day range of other forecasters. Analysts are more divided over the prospects for growth in non-OPEC total liquids production, with EIA's projections of 0.8 million barrels per day growth in 2006 on the low end. Most projections range between 0.9 and 1.4 million barrels per day, although several other forecasters have an even lower estimate of 0.5 million barrels per day.

According to EIA's most recent *Short-Term Energy Outlook*, released April 11, 2006, continued steady world oil demand growth, only modest increases in world surplus oil production capacity, and the continuing risks of geopolitical instability and weather are expected to keep crude oil prices high through 2006. The price of WTI crude oil is projected to average \$65 per barrel in 2006 and \$61 in 2007. We are currently in the process of compiling our May *Outlook* for release on May 9, which will likely incorporate some upward adjustment to projected prices in light of recent market developments.

World oil market conditions, growth in U.S. demand, and ongoing implementation of domestic fuel quality requirements are all expected to keep consumer prices for motor fuels and other petroleum products high in 2006. Higher crude oil costs together with higher margins (retail price minus crude oil cost and taxes, per gallon) are also expected to contribute to increases at the pump. Higher gasoline margins are likely because: 1) gasoline consumption is expected to grow solidly following weak growth in 2005; 2) Tier 2 gasoline requirements mandate further reduction in sulfur content this year; 3) phase-out of methyl tertiary butyl ether (MTBE) from the gasoline pool is likely to put significant pressure on ethanol and gasoline prices; and 4) there has been an unusual level of refinery outages due in part to hurricane-related deferred maintenance. Higher diesel fuel margins are expected because of the additional cost of producing ultra-low-sulfur diesel fuel later this year.

EIA View of Capacity Additions. In OPEC, surplus production capacity will remain tight in 2006, but EIA expects around 600 thousand barrels per day of surplus crude oil production capacity growth and 600 thousand barrels per day of non-crude production growth. Specifically, the UAE could add 200 thousand barrels per day from de-bottlenecking the Zakum and Umm Shaif fields. New crude oil production

capacity at the Bonga and Erha fields in Nigeria has been offset by disruptions to Shell-owned, offshore oil production, and these recent disruptions could have longer-term implications for net supply growth from Nigeria. Algeria's production is expected to increase by 100 thousand barrels per day from increased oil and condensate production. Libya could also add 100 thousand barrels per day, primarily from enhanced recovery from existing fields. Iran and Indonesia are projected to lose capacity by 2007. This year, EIA expects non-OPEC total liquids supply growth of up to 800 thousand barrels per day, and we expect an additional 1.5 million barrels per day in 2007. One major portion of the increases in non-OPEC supply in 2006 is simply recovery from the Gulf of Mexico hurricanes. Improvements to oil supply recovery technology in the Gulf of Mexico, recovery of the Mars production platform, and the beginning of production from the Thunderhorse and Atlantis fields account for a large portion of growth from the United States. By the fourth quarter of 2007, oil production from these fields is expected to account for about 10 percent of the lower-48 oil production. Outside of the United States, major supply additions in the Caspian, Brazil, and West Africa stem the decline in mature field production in the North Sea, Russia, the Middle East, and Mexico.

Major projects in Angola include the Chevron-led Benguela Belize project, of 200 thousand barrels per day, and the ExxonMobil-led Kizomba B and C projects, of 250 thousand and 240 thousand barrels per day, respectively. By the time these projects are all producing at their maximum rates in 2007 and 2008, they will have added almost 700 thousand barrels per day to Angola's existing production. In the Caspian, the BP-led consortium that is developing the Azeri-Chirag-Guneshli (ACG) project will increase production by around 400 thousand barrels per day between 2005 and 2007. The project operators maintain that they will be able to double Azerbaijan's existing production to around 1 million barrels per day by 2010. Finally, in Canada, conventional oil production in the Western Canada Sedimentary Basin will continue to decline at around 3 percent per year. Taking into account nonconventional growth from oil sands, EIA still expects 400 thousand barrels per day of net growth from Canada between 2005 and 2007.

Based on projects that are already in the pipeline, there is a strong likelihood that additions in OPEC and non-OPEC capacity will exceed demand growth between 2008 and 2010. World surplus production capacity could grow to 3 to 5 million barrels per day by 2010, substantially thickening the surplus capacity cushion, if demand projections prove accurate. A larger surplus capacity cushion would

undoubtedly be beneficial. Based on recent experience, it is clear that geopolitical developments in oil-producing areas will also be important to the future supply situation, but EIA has no basis for projecting whether the overall stability of these areas will improve or deteriorate.

This concludes my testimony, Mr. Chairman and members of the Committee. I will be happy to answer any questions you may have.